

REMARKS

Amended Claim 1 provides a complex compound composed of polyvinyl alcohol, water and at least one inorganic compound selected from silicic acid compound, tungstic acid compound, molybdic acid compound, stannic acid compound, and zirconic acid compound.

A "complex compound" is not simply a mixture of polyvinyl alcohol with an inorganic compound. Rather, a complex compound is an actual compound where the polyvinyl alcohol is *chemically bonded* to the inorganic compound by way of a raw hydroxyl group such that the *chemistry* of the complex compound is changed from that of a polyvinyl alcohol. In particular, the complex of polyvinyl alcohol is no longer solvent in water.

Attention is directed to page 23, line 19 of the specification where it is stated:

"In the complex compound which is composed of polyvinyl alcohol, water, and the inorganic compound such as silicic acid compound, tungstic acid compound, molybdic acid compound, stannic acid compound, and zirconic acid compound, according to the present invention, the polyvinyl alcohol intertwines with the inorganic compound in micro-level. The polyvinyl alcohol is combined to the inorganic

compound by hydrogen bond or hydrolytic condensation through hydroxyl group."

Further attention is directed to page 8, line 4 of applicant's specification:

"The proton conductivity is given together with water resistance and strength to the polyvinyl alcohol by chemically bonding the polyvinyl alcohol to the inorganic compound."

Turning to the references applied in the Office action, the claims have been rejected as anticipated by Matsudaira et al. Matsudaira et al. discloses "a mixture" col. 6, lines 45-60) of polyvinyl alcohol which serves as a binder and an inorganic compound such as silicic acid compound, stannic acid compound and zirconic acid compound (col. 4, line 27; col. 5, line 60). Matsudaira et al. further discloses "milling the mixture" in which polyvinyl alcohol and an inorganic compound are mixed physically. The difference between the claimed complex compound of the present invention and the mixture taught in Matsudaira et al. is that the polyvinyl alcohol of Matsudaira et al. is unable to be solvated in water after milling of the polyvinyl alcohol with the inorganic compound. Accordingly, the claimed complex compound is not taught by the mixture of Matsudaira et al.

In addition, Claim 1 has been amended to recite a solid electrolyte including a complex compound which is composed of polyvinyl alcohol, water, and at least one inorganic compound selected from silicic acid compound, tungstic acid compound, molybdic acid compound, stannic acid compound, and zirconic acid compound, characterized by a part or all of hydroxyl groups of the polyvinyl alcohol domain *are acetalized by a reaction of aldehyde with said solid electrolyte including complex compound, and are replaced by groups having less water absorption than that of an hydroxyl group.* Thus, acetalizing of the hydroxyl groups of the polyvinyl alcohol domain replaces certain hydroxyl groups with less hydrophilic groups thereby solving the swelling problem identified in applicant's specification at page 10, lines 23-27 and at page 11, lines 1-15. This claimed step is not taught by Matsudaira et al.

Attention is redirected to page 23, line 19 of applicant's specification:

"In the complex compound which is composed of polyvinyl alcohol, water, and the inorganic compound such as silicic acid compound, tungstic acid compound, molybdic acid compound, stannic acid compound, and zirconic acid compound, according to the present invention, the polyvinyl alcohol intertwines with

the inorganic compound in micro-level. The polyvinyl alcohol is combined to the inorganic compound by hydrogen bond or hydrolytic condensation through hydroxyl group. However, the polyvinyl alcohol has partial area which is not combined to the inorganic compound. The hydroxyl group of the partial area is combined to water in case of positioning the solid electrolytic film is the wet condition. As a result, the solid electrolytic film is expanded by water absorption. Therefore, it is possible to prevent the swelling of the solid electrolytic film in case of replacing the hydroxyl group to a group which has a water absorption less than that of the hydroxyl group."

And further at page 24, line 17 of applicant's specification:

"[t]he hydroxyl group, which is not combined to the inorganic compound of polyvinyl alcohol domain, is preferably acetalized, when the sold electrolytic film is reacted to aldehyde."

Matsudaira et al. at col. 6, line 53 discloses a "partially saponified vinyl acetate, partially acetylated polyvinyl alcohol" but for use as a raw polyvinyl alcohol. There is no disclosure of an acetalizing step. Accordingly, Matsudaira et al. does not anticipate the invention as now claimed.

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Claims 1-14 have also been rejected as anticipated over Sawa et al. Sawa discloses a complex compound of a silicic acid compound and a polyvinyl alcohol but fails to disclose the acetalizing step which replaces certain hydroxyl groups with less hydrophilic groups in the manner as claimed in claim 1 so as to remedy the prior art swelling problem. Sawa et al. teaches addition of polyethylene glycol rather than the polyvinyl alcohol as recited in claim 1. Sawa et al. disclose at page 64 that polyethylene glycol causes less water resistance when it is added in amounts over 50%. Sawa et al. does disclose at page 53 that a polyvinyl alcohol may be used; however, there is no teaching of the claimed acetalizing steps which replaces certain hydroxyl groups with less hydrophilic groups.

Claim 15 has been cancelled thereby obviating the obviousness rejection of that claim.

An Information Disclosure Statement addressing the issues raised by the examiner in the Office action is being separately filed.

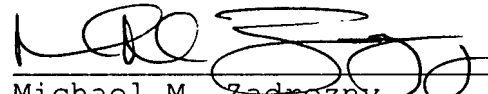
Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

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It is believed that no additional fee is due, however,
should that be incorrect, please charge to Deposit Account
No. 19-2105 and inform the undersigned in due course.

Respectfully submitted,

Date: July 5, 2007


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